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## FEEDING SUBMARINE CREWS

[Following is the translation of an article by Colonel D. Stroganov and Captain V. Kozlov, published in the Russian-language periodical Tyl i Snabzheniye Sovetskikh Vooruzhennykh Sil (The Rear and Provisioning of Soviet Armed Forces), No 12, Dec, 1967, pages 43-45.]

The specific conditions of living on submarines requires the carrying out of a complex of measures for preserving the health and maintaining the work capacity of personnel. One of these measures is the rational organization of feeding. In our fleet, a certain amount of experience has been accumulated on the supplying of submarines with provisions at bases, and also the organization of feeding crews on lengthy trips.

Personnel on submarines which are on a voyage receive a high-calorie ration. A wide assortment of products makes it possible to prepare tasty and diverse food. In order that these capabilities are transformed to life the collective of specialists at shore bases and on submarines have to work hard. This task is laborious and requires knowledge and skill.

Prior to the departure of a submarine on a prolonged voyage (by 7-10 days) our heads of the ration supply and medical services compile a plan for the supplying of rations and the organization of feeding. Taking part in this are the commander of the submarine or his second in command, the surgeon, and the senior cook-instructor. The plan, depending on the duration of the voyage and the conditions for the storage of rations on the submarine, reflects the following problems: the ratio between fresh and canned products in the total reserves of rations; choice of items based on designation; sequence of consumption of items; type of packaging for containing the items at the shore base; period and sequence for loading the rations on the ship.

On submarines, where there is a shortage of refrigerator units, for increasing the refrigeration capacity as a rule two ordinary refrigerators are set up.

In connection with certain peculiarities of feeding on trips to southern latitudes, up to 50% of the herring which is usually carried is replaced by vegetable snack and fish preserves in tomato sauce and in their own juice. All the remaining items are eaten on for the entire trip.

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Considering how important fresh commodities are for the preparation of high quality food, the submariners take meat, fish, eggs, potatoes, and fresh vegetables for the maximum possible periods. Replacement of these items with canned goods is done only in the case when it is impossible to guarantee their storage.

Now it has been established that on submarines items should be supplied in the following assortments: groats - no less than four and macaroni goods - no less than three items; snack meat preserves - five items with the compulsory inclusion of preserves in tomato sauce, in their juice, and in oil; canned fruits - three items; snack vegetable preserves - five items. We not only maintain this assortment as minimum, but in many cases considerably exceed the established norm. For example, meat is issued to the ship in approximately the following ration: cuts of pork - 50%; beef - 30%; mutton - 10%; poultry - 10%. Only recently prepared canned goods are supplied, and potatoes, vegetables, and fruits are carefully sorted out.

In recent years there has been considerable improvement in the packing of products to be used for feeding submariners. However, often there are cases when the rations which are received from industry are in containers which are not suitable for distribution and storage. Therefore, packing and repacking of such products (except potatoes, fresh vegetables, meat, and bread) are organized at the fleet ration supply dump. Potatoes, fresh vegetables, and meat are packed at warehouses at shore bases.

Bread for prolonged storage (alcohol sterilization) is baked and wrapped at the fleet bakery. Each loaf is wrapped in filter paper, sterilized with alcohol, and packed in an individual packet made of polyethylene film, the neck of which is fused. The parcels with bread are packed in cardboard boxes. Their vents are closed and the seams are glued with paper tape. An electromechanical press has been designed and made for fusing the polyethylene packets.

Flour, groats, rice, macaroni items, dry fruits, and other friable products are packed in paper packets weighing 1-3 kg. The filled packets are glued or fastened with metal clamps and packed in group inserts made from polyethylene film. The necks of the packets or inserts are fused. Then the packets with the products are packed in cardboard boxes. Such packing protects them from the penetration of moisture and odoriferous vapors, which is of great importance under conditions on a submarine.

Refined sugar in packages and also packaged macaroni items are placed in group polyethylene inserts and then in cardboard boxes.

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Salt and mustard powder, which are packed in paper packages, are then placed in containers made from polyethylene and packed in boxes.

Salted herring, sauerkraut, pickled cucumbers are shipped to the submarines in 15-liter casks or in tin pots. It is necessary to note that during the loading of these products into casks on the submarines a specific odor is spread throughout all the compartments. It is preserved during the entire voyage, since the empty packages are preserved until the end of the trip. We consider that on submarines these products should be supplied in tin pots.

We pack eggs in cardboard boxes with a capacity of 100 or 360 eggs with a tuberos lining, and vegetable oil is shipped in 10-20 liter aluminum tanks. Sunflower <sup>7</sup>/<sub>8</sub> oil, frozen meat in jars, and fish filet are not repacked. When delivered to submarines, lump meat is removed only from the isothermic container, and bulk and semibulk meat is cut into pieces weighing 2-3 kg, which are packed in cardboard boxes with openings for ventilation. Smoked meats, thoroughly smoked and semismoked sausages, and smoked fish are wrapped in oil paper and packed in cardboard boxes with openings for the circulation of air.

Bread, potatoes, and fresh vegetables are supplied in special sacks made from canvas. During short trips to sea potatoes can be stored on submarines in these sacks, but on long trips it is better to have them in wooden box-coops with a capacity of 30-35 kg. On some ships wooden boxes are mounted in the compartments. These boxes have a capacity of 200-400 kg each. Thus, on the submarine where the senior cook-instructor is Chief Petty Officer S. Kerebov, in the first compartment between the torpedo tubes two boxes with a capacity of 400 kg each are set up prior to a voyage. This made it possible to provide fresh potatoes for the crew of the ship for the entire voyage.

On submarines they endeavor to accomodate products with a consideration of their physical chemical properties. But all the items usually cannot be contained in the ration storerooms. Therefore, biscuits, hard tack, soonika [small dried crackers], bread, potatoes, and vegetables are placed in the compartments. We give special attention to the correct storage of products in refrigerated areas, provision storerooms, and also in the compartments. This makes access to them, makes it possible to fulfill the 10-day expenditure plan, and guarantees the preparation of diverse food.

In the organization of high-quality feeding, much depends on the doctors and the cooks on the submarine. They take part in compiling the plan for feeding on a voyage, for planning, invoices and distribution of food. In addition to this, the doctor controls the quality of the rations, their storage, and also the high quality of the food. In our fleet much credit belongs to the doctors whose experience, knowledge, and skill go into this. Among them are officers D. Sigorsky, S. Kerebov, and others.

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An important role belongs to the senior cook-instructor. We will always remember this. For improving the specialized knowledge and practical skills of cooks we conduct classes at shore base. Great successes were achieved in these classes and in practical work by senior cook-instructors V. Bigas, F. Korobov, and V. Gukov.

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Tasty food is prepared by senior cook-instructor V. Gukov.  
Photo by Warrant Officer Yu. Kamenetskiy.

They conscientiously strive for fulfillment of their service obligation. They prepare tasty and diverse dishes.

On the submarines where they serve, during voyages the food is prepared daily according to a ration-apportionment plan. This takes into consideration the desires of the personnel, the conditions of the trip, and the types of products. No matter how difficult the situation the submariners are ensured a well-rounded feeding. Hot food is put out for breakfast, dinner, and supper.

In our fleet it became the rule to apportion the daily norm of products according to caloric value in the following manner: breakfast 26-28%, dinner 31-34%, supper 25-23%, and evening tea 15-17%.

For breakfast we usually issue plum seed oil, meat snacks, cheese, eggs, easy to prepare hot meat dishes, macaroni items, milk porridge, and hot drinks (tea, coffee, cocoa).

For dinner and supper we have a cold snack (mixed salad, lettuce, herring with garnish, vegetable snack preserves, etc.), the first and second dishes, and in the third - stewed fruit, kissel [jelly-like dish], fresh fruits or fruit juices; for evening tea - snack items, pastry, sooshka, jam, rolls and buns, fresh fruits, hot drinks.

Naturally in southern latitudes the regimen of feeding is different. The high temperature and air humidity increases thirst, changes the taste senses, and reduces appetite. This circumstance requires the appropriate selection of products and their placement in the menu, and also a different assortment of prepared dishes. At increased air temperature there is value in milk soups and porridge, vegetable dishes, cold soups (cold kvass soup, beetroot soup, fruit soup), a la carte dishes of nonfat meat, fresh fruits, juices, mixed salad, kissel. The requirement for fatty items, salt products, and bread is reduced.

There, where strict attention is paid to external conditions which influence a change in taste and the needs of the submariners, there will never be complaints about the food, the personnel will always have a high work capacity and a good attitude, and this has a favorable influence on combat training.

[Translator's note. On page 3 the word sunflower should be plum seed. In the original article the Russian word was illegible and it only developed subsequently that this should be plum seed oil.]